

## CLAIMS

1. A control circuit including:
  - at least two input terminals for electrically connecting with respective conductors of a mains power source;
  - 5 at least two output terminals for electrically connecting with a mains load;
  - a sensor that is responsive to a reference signal being in the range of about 1 Volt to 50 Volts for providing a sensor signal, the reference signal being derived from a voltage differential between one or more of the conductors and a reference point that should, in use, be electrically isolated from the conductors; and
  - 10 a switching device that is responsive to the sensor signal for progressing between a first mode and a second mode wherein: in the first mode the input and output terminals are respectively electrically connected for allowing the load to receive power from the source via the switching device; and in the second mode the input and output terminals are electrically disconnected for preventing the source from
  - 15 supplying power to the load via the switching device.
2. A circuit according to claim 1 that is a protective device for electrically isolating the load from the power source once a fault condition has been detected.
3. A control circuit including:
  - at least two input terminals for electrically connecting with a power source;
  - 20 at least two output terminals for electrically connecting with a load;
  - a sensor that is responsive to a reference signal being within a predetermined range for providing a sensor signal; and
  - a switching device that is responsive to the sensor signal for progressing from a first mode to a second mode wherein: in the first mode the input and output
  - 25 terminals are respectively electrically connected for allowing the load to receive power from the source via the switching device; and in the second mode the input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching device.
4. A circuit according to claim 3 wherein, if the reference signal moves outside that predetermined range, the switching device remains within the second mode.
5. A circuit according to claim 3 wherein the reference signal is a voltage, and the predetermined range is greater than about 1 Volt.
6. A circuit according to claim 3 wherein the power source provides a nominal

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source voltage, and the predetermined range has a lower limit that is less than 5% of the nominal source voltage.

7. A control circuit including:

at least two input terminals for electrically connecting with a power source;

6 at least two output terminals for electrically connecting with a load;

a sensor that is responsive to a reference signal being within a predetermined range for providing a sensor signal; and

a switching device that is responsive to the sensor signal for progressing from a first mode to a second mode wherein: in the first mode the input and output

10 terminals are respectively electrically connected for allowing the load to receive power from the source via the switching device; and in the second mode the input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching device.

8. A circuit according to claim 7 that is a protective device for electrically

15 connecting the load to the power source once a fault condition has been detected.

8. A control circuit including:

at least two input terminals for electrically connecting with a power source;

at least two output terminals for electrically connecting with a load;

20 a sensor that is responsive to a reference signal being within a predetermined range for providing a sensor signal; and

a switching device that is responsive to the sensor signal for progressing between a first mode and a second mode wherein: in the first mode the input and output terminals are respectively electrically connected for allowing the load to receive power from the source via the switching device; and in the second mode the

25 input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching device.

9. A wiring system for carrying a mains supply from a mains source having at least two mains conductors, the system being installed at a site and including:

a transformer located at or near the site and having one or more primary

30 windings for connecting to the mains conductors and one or more secondary windings to provide a site voltage that is substantially equal to the mains supply;

at least two site conductors that are installed at the site for electrically connecting with the one or more secondary windings for distributing the site voltage

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to predetermined locations about the site; and

a floating conductor that is installed at the site for providing a common reference voltage with respect to one or more of the site conductors.

10. A system according to claim 9 wherein one of the mains conductors is a mains  
5 neutral conductor that is earthed and one of the site conductors is a site neutral conductor that is not earthed.

11. A wiring system for carrying a mains supply from a mains source having at least two mains conductors, the system being installed at a site and including:

a transformer located at or near the site and having one or more primary  
10 windings for connecting to the mains conductors and one or more secondary windings to provides a site voltage that is substantially equal to the mains supply;

at least two site conductors that are installed at the site for electrically connecting with the one or more secondary windings for distributing the site voltage to predetermined locations about the site; and

15 a floating conductor that is associated with a load installed at the site for providing a reference voltage with respect to one or more of the site conductors.

12. A control circuit including:

at least two input terminals for electrically connecting with a power source;

at least two output terminals for electrically connecting with a load;

20 a sensor having a sensor relay that is responsive to a reference signal being within a predetermined range for providing a sensor signal; and

a switching device having a switching relay that is responsive to the sensor signal for progressing between a first mode and a second mode wherein: in the first mode the input and output terminals are respectively electrically connected for  
25 allowing the load to receive power from the source via the switching relay; and in the second mode the input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching relay.

13. A circuit according to claim 12 wherein the sensor relay is a low voltage DC relay and the switching relay is a mains relay.

30 14. A control circuit for a mains load having a component that, in normal use, is electrically isolated from a mains power source, the circuit including:

at least two input terminals for electrically connecting with the mains power source;

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- at least two output terminals for electrically connecting with the load;  
a sensor that is responsive to a voltage between the component and one or more of the input terminals being within a predetermined range for providing a sensor signal; and
- 5 a switching device that is responsive to the sensor signal for progressing between a first mode and a second mode wherein: in the first mode the input and output terminals are respectively electrically connected for allowing the load to receive power from the source via the switching device; and in the second mode the input and output terminals are electrically disconnected for preventing the source from
- 10 supplying power to the load via the switching device.
15. A control circuit including:  
at least two input terminals for electrically connecting with a power source;  
at least two output terminals for electrically connecting with a load;  
a switching relay having a switching coil that is selectively energised to
- 16 progresses the relay between two modes wherein: in one of the modes the input and output terminals are respectively electrically connected for allowing the load to receive power from the source via the switching relay; and in the other mode the input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching relay; and
- 20 a sensor relay that is responsive to a predetermined condition for energising the coil of the switching relay.
16. A circuit according to claim 15 wherein the sensor relay has a low voltage coil that is energised in response to the fault condition.
17. A circuit according to claim 16 wherein the low voltage coil is energised by a
- 25 DC voltage.
18. A circuit according to claim 17 wherein the low voltage coil is energised by a DC voltage of about 1 Volt.